

*Supplementary information*

**IMPACT OF THE COVID-19 LOCKDOWN ON AIR POLLUTION  
IN AN INDUSTRIAL CITY IN NORTHEASTERN CHINA**

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Table S1. Names, longitudes and latitudes of monitoring stations in Shenyang

Code of monitoring stations	Name of monitoring stations	Latitude (°)	Longitude (°)	Category
1098A	Senlin Road	41.9339	123.6836	Suburb
1099A	Eastern Hunnan Road	41.7561	123.535	Downtown
1100A	Xinxiu Street	41.7089	123.439	Downtown
1102A	Donglin Road	41.8336	123.542	Suburb
1103A	Lingdong Street	41.8472	123.428	Downtown
1104A	Wenhua Road	41.765	123.41	Downtown
1105A	Xiaoheyang Street	41.7775	123.478	Downtown
1106A	Taiyuan Street	41.7972	123.3997	Downtown
1108A	Jingshen Street	41.9228	123.3783	Suburb

Table S2. The passenger volume, tourist numbers and the total amount of pollutant emissions in Shenyang from 2015 to 2020

Year	Passenger volume (10,000 persons)				Tourist numbers (10,000 persons)	Pollution emissions (t)		
	Urban public transport	Highway passenger traffic	Railway passenger traffic	Civil aviation passenger traffic		Volume of industrial sulphur dioxide	Volume of industrial nitrogen dioxide	Volume of industrial soot (dust)
2015	104,971	15,554	4,427	662	9,219	97,839		84,871
2016	100,232	15,244	4,718	674	6,402	37,530		30,130
2017	104,264	14,780	4,841	699	7,234	25,904	37,721	20,489
2018	110,200	14,449	4,978	714	8,257	18,547		8,166
2019	110,031	13,760	5,308	780	9,510	17,052	31,603	12,413
2020	66,998	4,893	2,441	446	5,411	9,671	15,885	4,178

Table S3. Air pollutant standards for urban areas set by China and (the units for PM<sub>2.5</sub>, PM<sub>10</sub>, SO<sub>2</sub>, NO<sub>2</sub>, and O<sub>3</sub> are μg m<sup>-3</sup>, whereas that for CO is mg m<sup>-3</sup>)

Items	Average Time	CAAQS Grade I standard	CAAQS Grade II standard
PM <sub>2.5</sub>	Daily	35	75
	Annual	15	35
PM <sub>10</sub>	Daily	50	150
	Annual	40	70
SO <sub>2</sub>	Daily	50	150
	Annual	20	60
NO <sub>2</sub>	Daily	80	80
	Annual	40	40
O <sub>3</sub>	8-h	100	160
CO	Daily	4	4

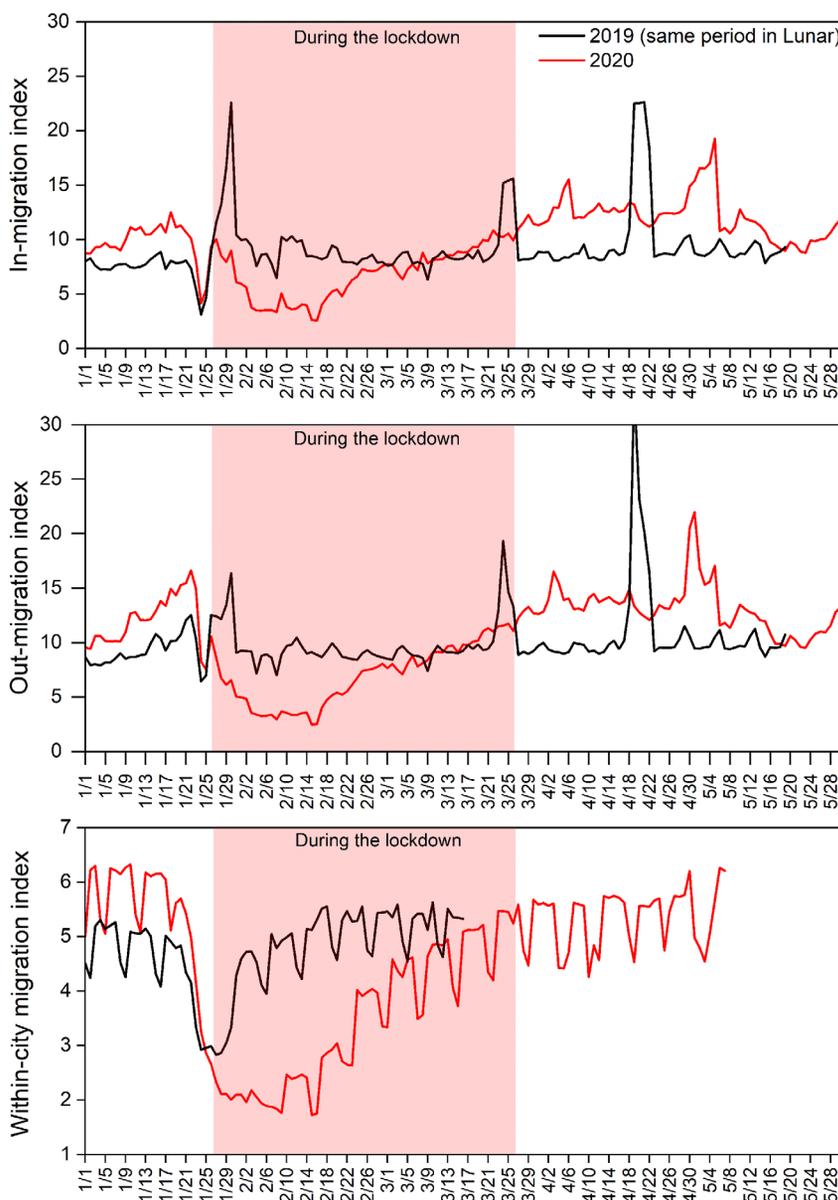


Figure S1. Daily in-migration index, out-migration index, and within-city migration index for Shenyang in 2019 and 2020

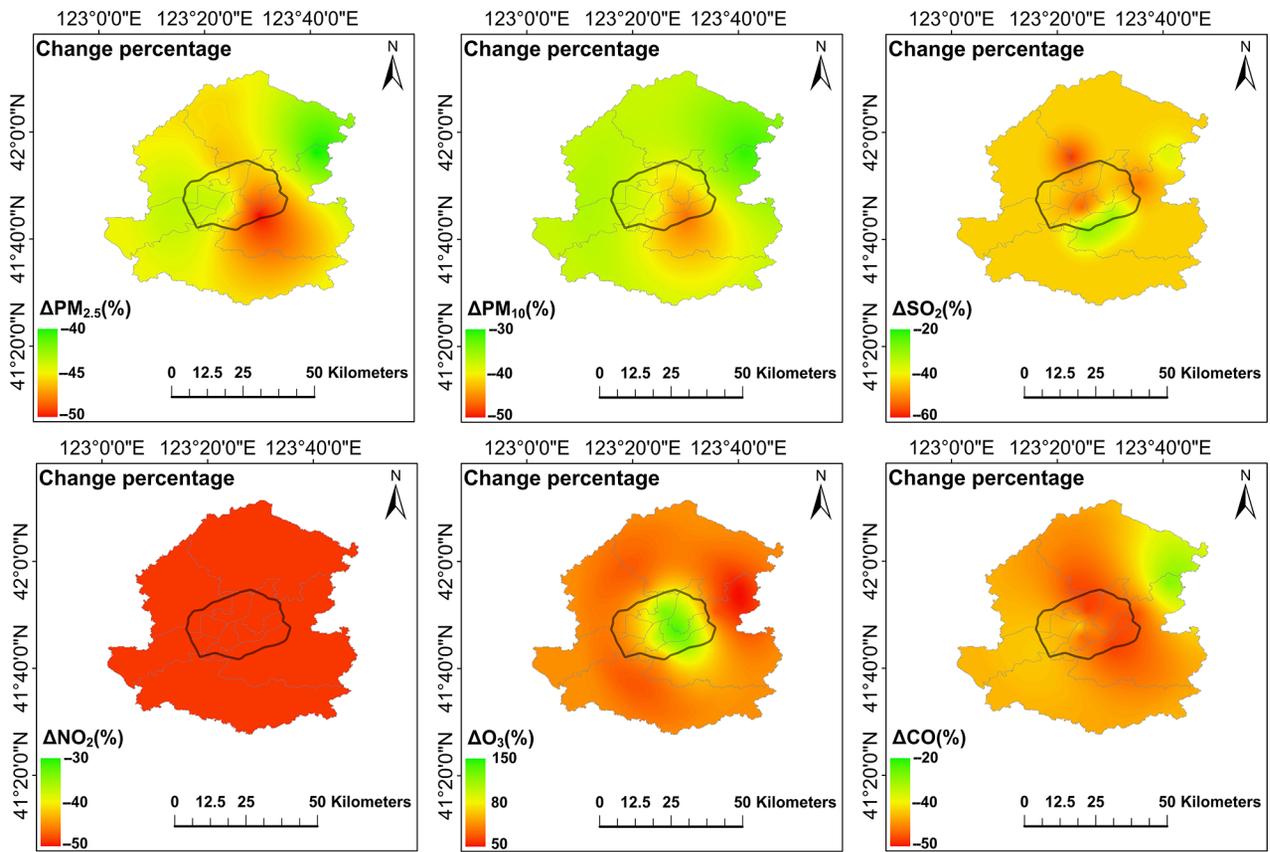


Figure S2. Changes in percentage of concentrations of six criteria air pollutants between pre-lockdown and the lockdown period in 2020. The black line represents the Third Ring Road of Shenyang. Areas within the black line is defined as the downtown area, and areas outside the black line represent the suburbs